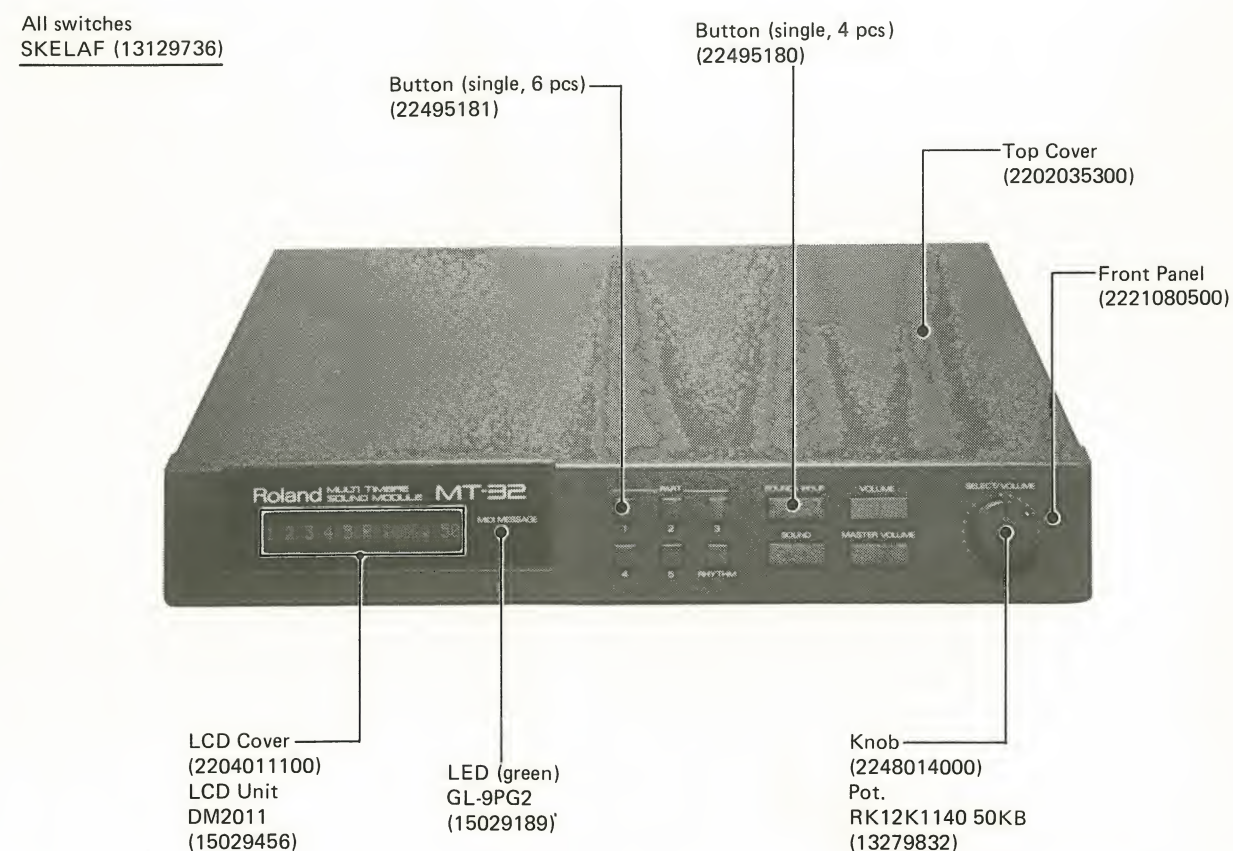
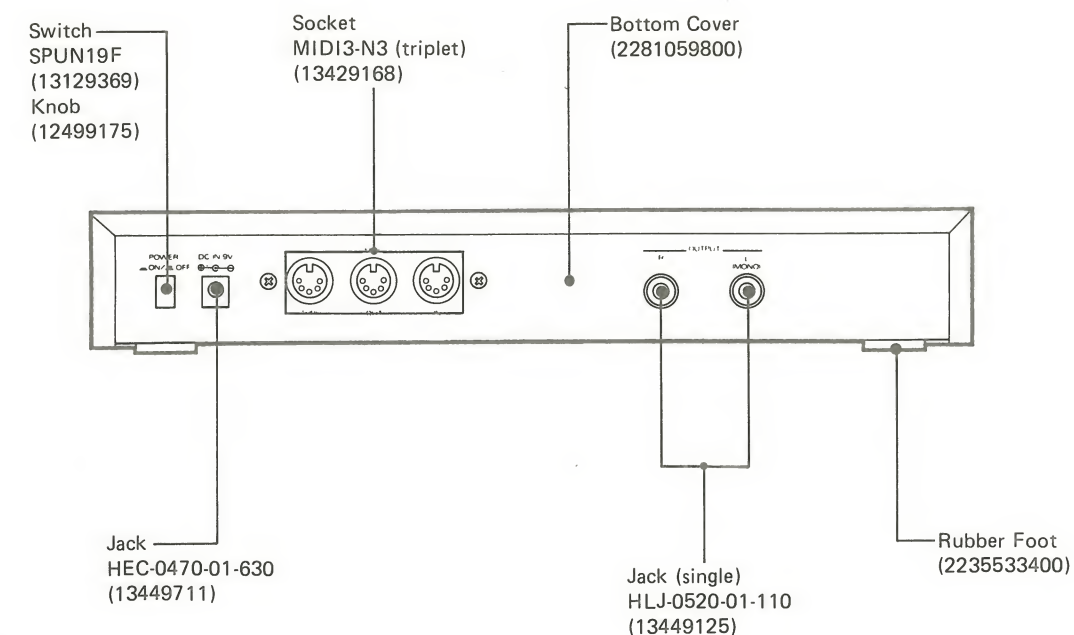
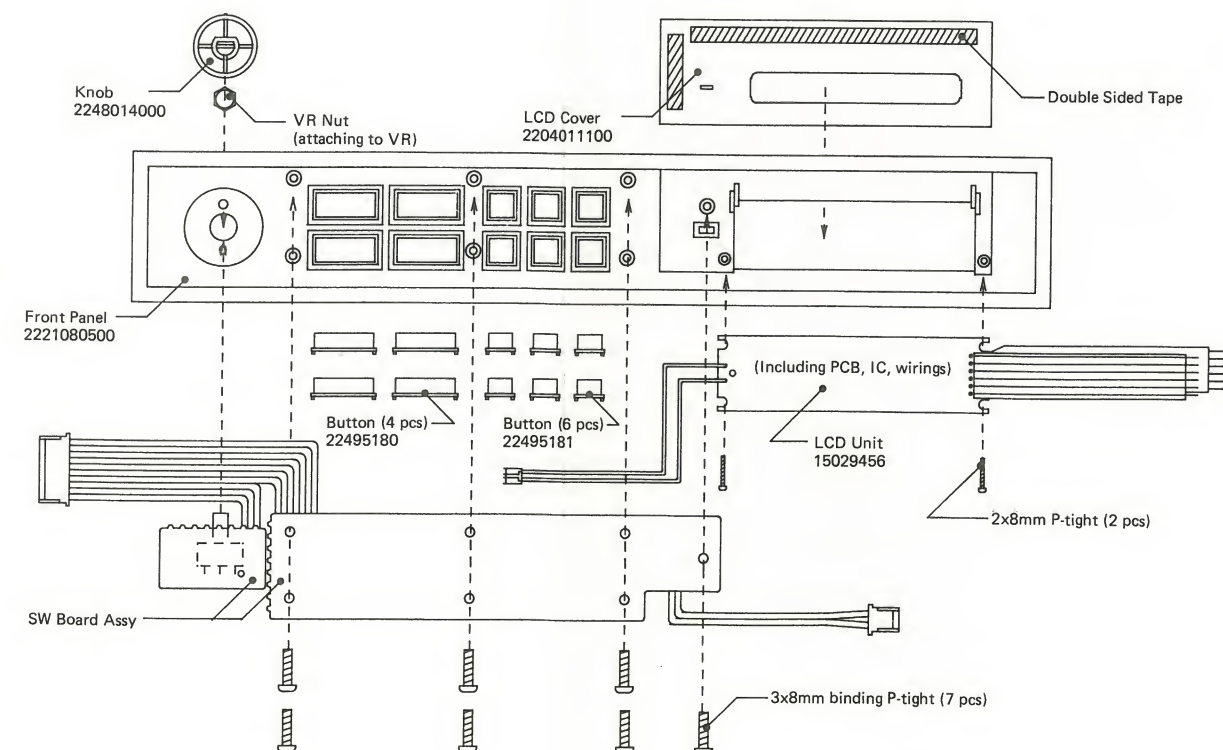
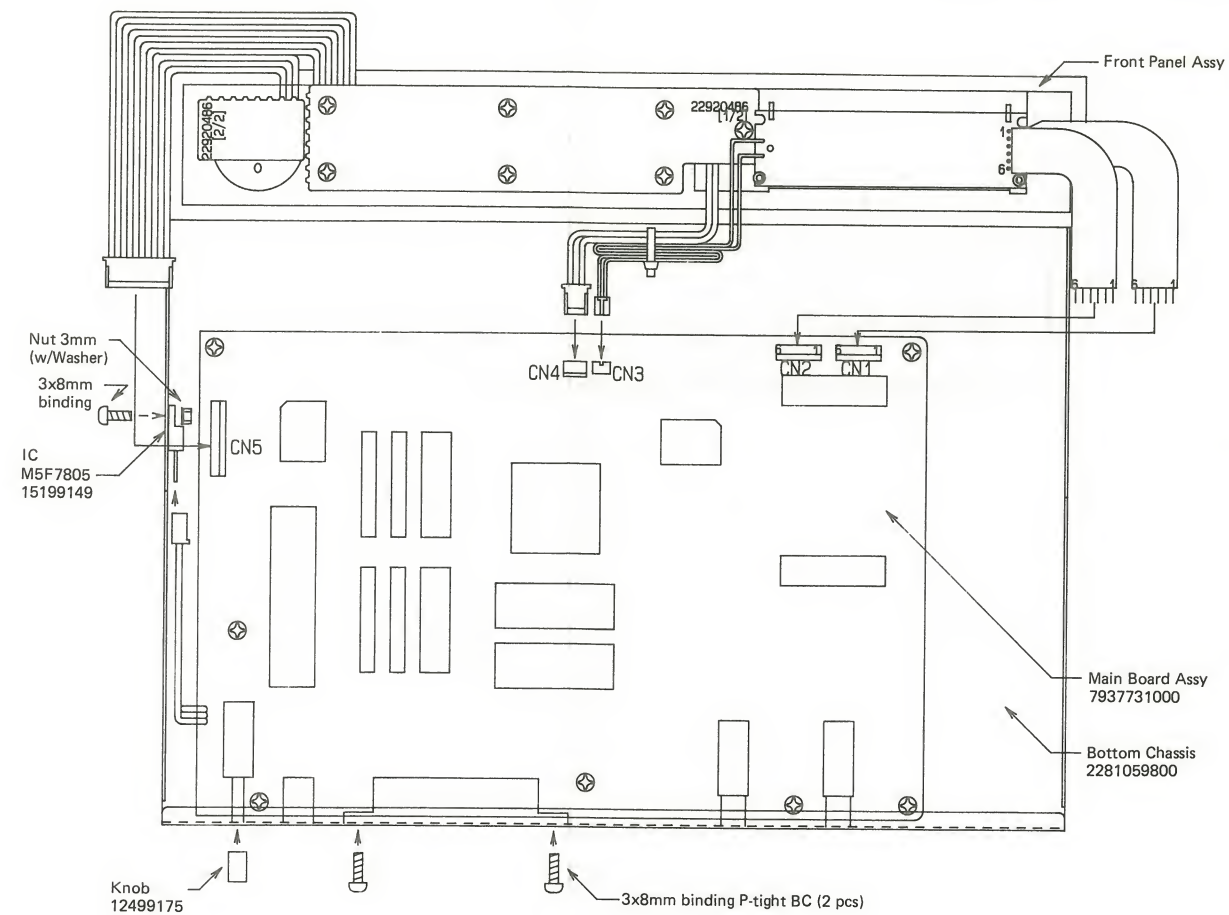


# MT-32 **SERVICE NOTES** *First Edition*

## SPECIFICATIONS

<b>Sound Sources</b>	:	32 polyphonic
<b>Preset Tones</b>	:	128
<b>Sampling Frequency</b>	:	32KHz
<b>Data Format</b>	:	15-bit linear
<b>Noise Level</b>	:	—80dBm (IHF-A) or less @25°C (77°F)
<b>Current Draw</b>	:	650mA @9V
<b>Power Consumption</b>	:	10W @100V
<b>(AC adaptor input)</b>	:	9.5W @117V
		10.5W @220—240V
<b>Dimensions</b>	:	51 (H) x 305 (W) x 220 (D) mm
		2 x 12 x 8-11/16 in
<b>Weight</b>	:	1.53 kg, 3 lb 6 oz
<b>Accessories</b>	:	AC Adaptor
		ACB-100 100V
		ACB-120 117V
		ACB-220 220V
		ACB-240A 240V (Australia)
		ACB-240E 240V (England)
		MIDI Cable (DIN Cord) (1m) 1 pc
		Connection Cord LP-25 2 pcs





Viewing at rear of unit

## EXPLODED VIEW

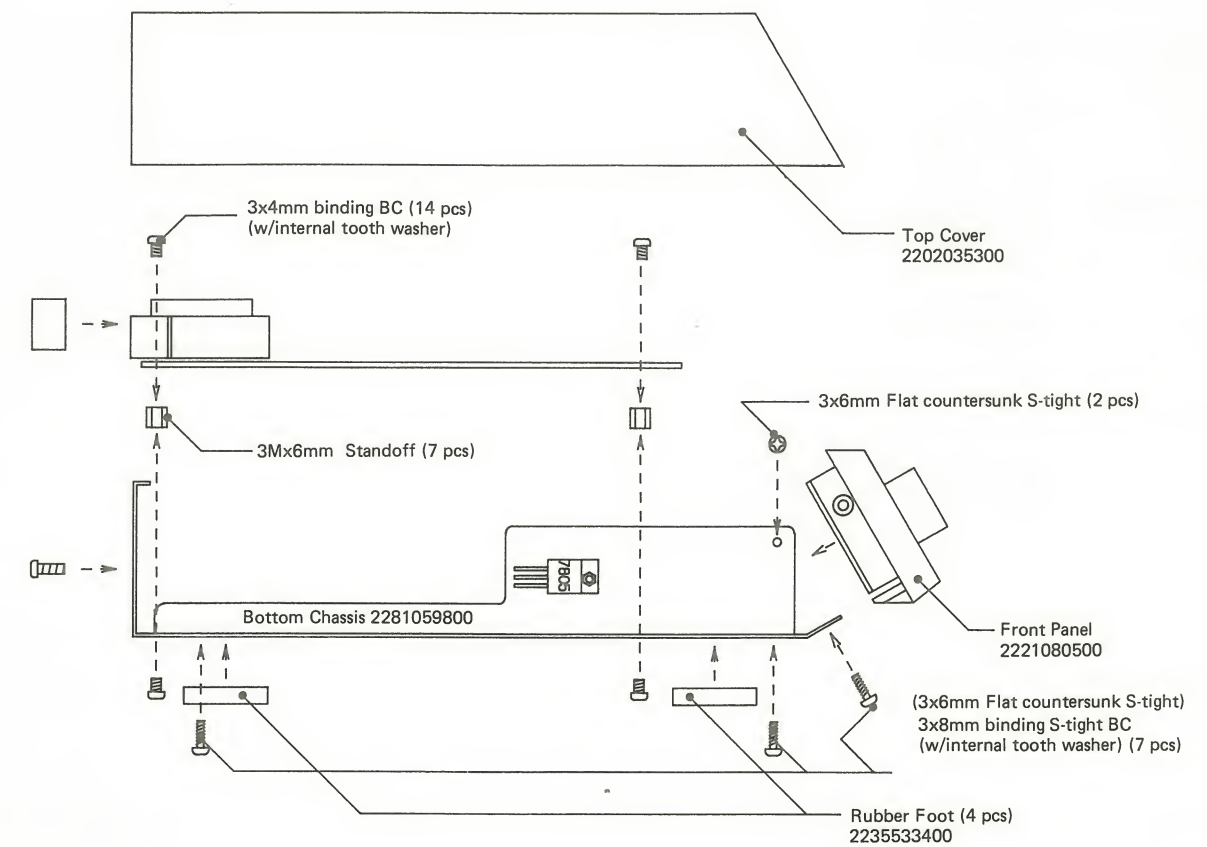
## NOTE

When inserting or pulling out flat cable at CN1 or CN2, push lock mechanism at the connector.

## 分解図

## 注意

CN1, CN2上でフラットケーブルを抜き差しする場合は、コネクタ上のロックを押して下さい。





## PARTS LIST

## CASING

2202035300	Top Cover
2281059800	Bottom Chassis
2221080500	Front Panel
2204011100	LCD Cover

## PCB ASSY

7937731000	Main Board	(pcb 2292048700)
7937742000	SW Board	(pcb 2292048600)
	(including VR board)	
	VR基板を含む	

## LCD UNIT

15029456	DM2011 (including PCB, IC, Connector and Cable)	
	No replacement for individual parts.	
	PCB,ケーブル,IC,コネクタを含む。これらの単独補修部品はありません。	

## BUTTON, KNOB

2248014000	Knob	SELECT/VOLUME
12499175	Knob	POWER
22495181	Button	PART
22495180	Button	SOUND GROUP, VOLUME
		SOUND, MASTER VOL

## SWITCH

13129369	SPUN19F	POWER
13129736	SKELAF	PART, SOUND GROUP
		SOUND, M. VOL

## JACK

13449125	HLT-0520-01-110	OUTPUT
13449711	HEC-0470-01-630	DC IN
13429168	MIDI3-NS (triplet)	MIDI

## IC

15179246	C8095-90	CPU
15229851	MB87136A	LA chip
15229865	HG61H15B59F	gate array
15229863	HG61H20R36F	reverb chip
15219178	PCM54HP	D/A converter
15179844	TC532000P-7471	2M mask ROM (WAVE) IC21
15179845	TC532000P-7472	2M mask ROM (WAVE) IC22
15449107	M5M27C256-A	EP ROM IC27
15449108	M5M27C256-B	EP ROM IC26
15449109	M5M27C128-15	EP ROM (reverb,ROM C) IC13
15179345	M5M4416P-12	D RAM
15179382	HM6264ALSP-15	S RAM
15169515	TC74HC00P	quad 2-input NAND
15169516	TC74HC02P	quad 2-input NOR
15169514	TC74HC04P	hex inverter
15169537	TC74HC27P	triple 3-input NOR
15169334H0	HD74LS05P	hex inverter with open collector output
15159113H0	HD14051	MUX/DEMUX
15199159	IR3M03A	DC-DC converter
15229706S0	PC910	optoisolator
15189171	M5218P	OP amp
15189147	NJM-072D	OP amp
15189188	M5238L	OP amp
15199149	M5F7805	regulator

## TRANSISTOR

15129172	DTC114T SPT
15119113	2SA1015GR
15129136	2SC2878A

## DIODE

15019126	1SS-133T-77	Main Board
15019291	1SR35-400	
15019103	1S2473	SW Board
15029189	GL-9PG2	LED green

## COIL

12449305	330μH	DC-DC converter
12449272	GM-50510152	line filter
12399501M1	BL02RN-R62	EMI filter

## XTAL

12389717	12MHz	CPU
12389774	32.768MHz	LA chip

## POTENTIOMETER

13279832	RK12K1140 50KB	rotary	SELECT/VOLUME
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## RESISTOR

13919303	RML S8 333J	3.3KΩx8
13799762	0.24Ω	metal oxide

## CAPACITOR

13639153S0	470μF/16V	electro
13639154S0	1000μF/16V	electro
13649103J0	10μF/16V	bi-polar
13629141	10μF/16V	Phillips 1225109

## CONNECTOR, CABLE

13439126	5045-10A	10P (CN5, Main Board)
13439119	5045-03A	3P (CN4, Main Board)
13439333	IL-S-2P-S2T2-EF	2P (CN3, Main Board)
23430525	52011-0610	6P (CN1, CN2, Main Board)
23410578	341-578 (w/leads)	3P (M5F7805-Main Board)
23410577	341-577 (w/leads)	3P (LED-CN4, Main Board)
23410576	341-576 (w/leads)	10P (SW Board-CN5, Main Board)

## AC ADAPTOR

12449546	ACB-100	100V
12449547	ACB-120	117V
12449548	ACB-220	220V
12449549	ACB-240A	240A (Australia)
12449564	ACB-240E	240E (England)

## MISCELLANEOUS

2215051200	Standoff	3x6mm
2235533400	Rubber Foot	
23485167	MIDI Cable	1m
23430675S0	Connection Cord	LP-25



## CIRCUIT DESCRIPTIONS

\*1 \*2 \*3 = ①②③ (Fig.1, Table 1)

CPU (IC34, Main board) processes MIDI IN data by running the operational program (stored in ICs 26 and 27) and reading sound parameters and other sound related data (stored in ROMs and RAMs: ICs 26-31). Then the CPU directs the LA chip IC23 to generate and output the necessary sound. The LA chip places the sound data on the data bus (D0-D15) connecting to both the Reverb chip IC17 and DAC IC8. The LA chip works in timesharing: It outputs data on the clock SH1 which in combination with SH2 and SH3 makes channel select code. If a data is to be reproduced as a direct sound only, the chip places the data during time slots 2 and 6. If reverb effect is required, then slots 1 and 5.

The data put out during slot 1(5) is not only accommodated by the reverb chip IC17 but also routed to DMUX where it is delivered to the correct S/H circuit on the code SH1-SH3, as a direct sound. Its reverb counterparts are placed on the data bus when time slot 7(8) comes.

## 回路解説

CPU (IC34) は MIDI IN データをオペレーショナルプログラム (IC26, 27) および音のパラメータ・データ (IC26-31) に基づいて処理し、その結果に応じた出力命令 (サウンド出力命令) を LA chip (IC23) へ与える。

LA chip は、サウンドデータを、D0-D15 から出力するが、方法は時分割式で、SH1 に同調させている。

Rev を伴わない音の場合は、タイムスロットの 2 と 6 で出力される。Rev を伴う音はスロットの 1 と 5 で出力される。後者の場合、データは、Rev chip に取り込まれる<sup>\*2</sup>とともに、DMUX へも送られ、SH1-SH3 からなるセレクトコードで目的の S/H 回路へダイレクト音として加えられる。一方、Rev chip で得られたリバーブ効果音は、スロット 7 と 8 で出力される<sup>\*3</sup>。

## BLOCK DIAGRAM

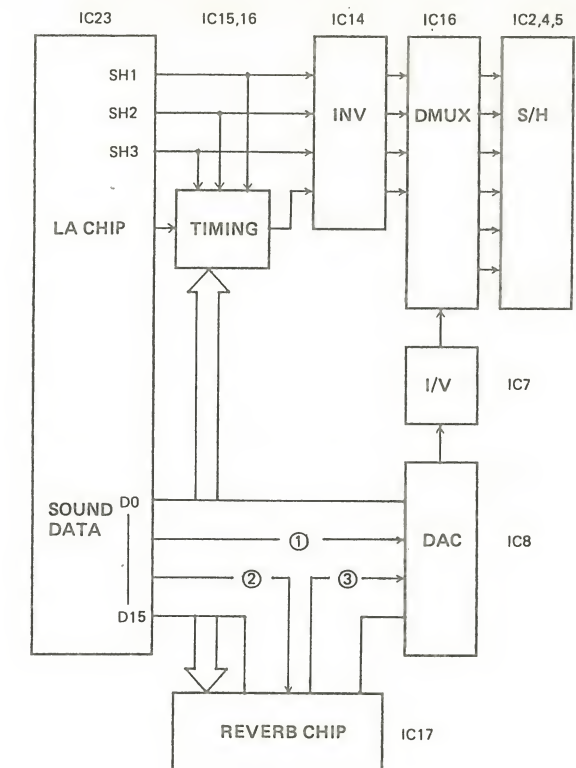
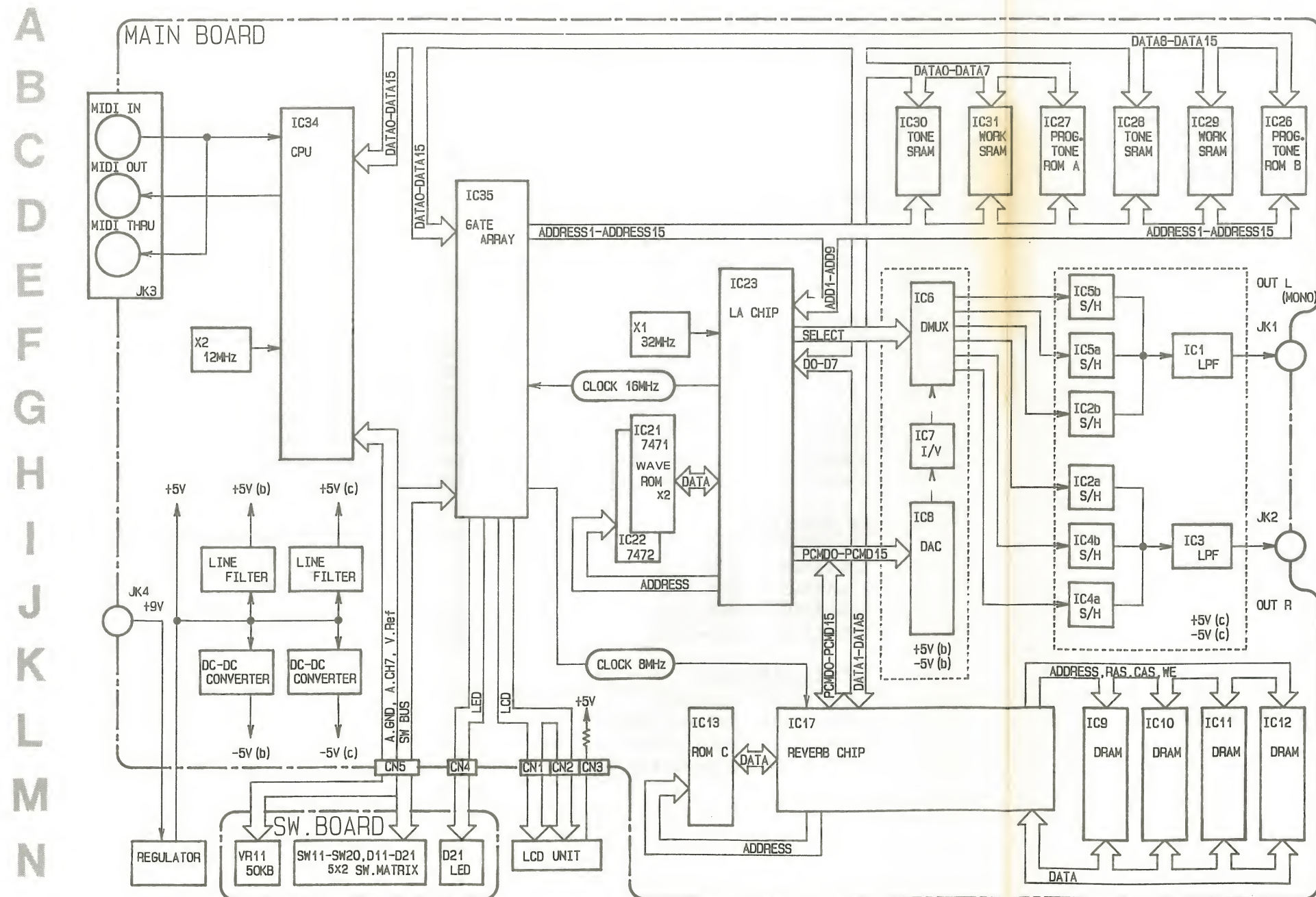


Fig.1

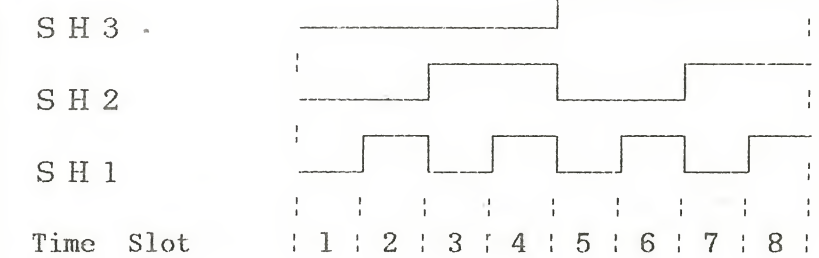
IC3  
PIN

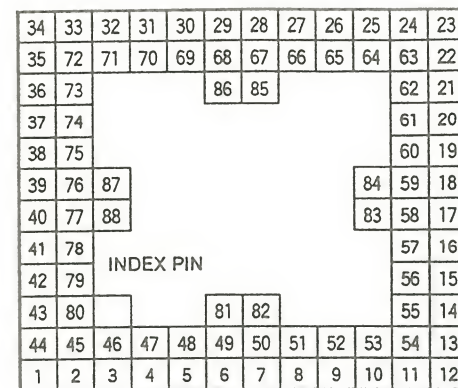
Fig.2

Time Slot	Signal Flow		DMUX Output	
			Pin	Sound
1	①	②	4	Direct R
2	①		2	Direct R
3	no sound			
4				
5	①	②	12	Direct L
6	①		15	Direct L
7	③		14	Rev R
8	③		13	Rev L

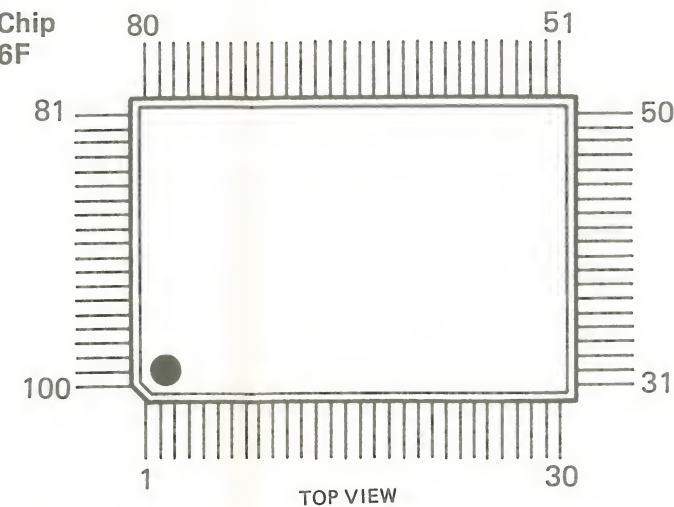
Table 1



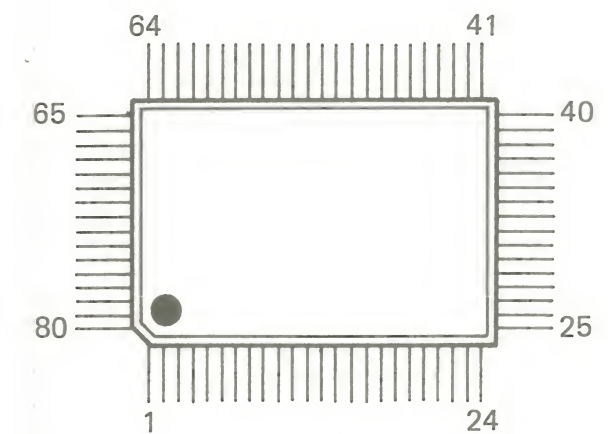
## IC DATA

IC23 LA Chip  
MB87136

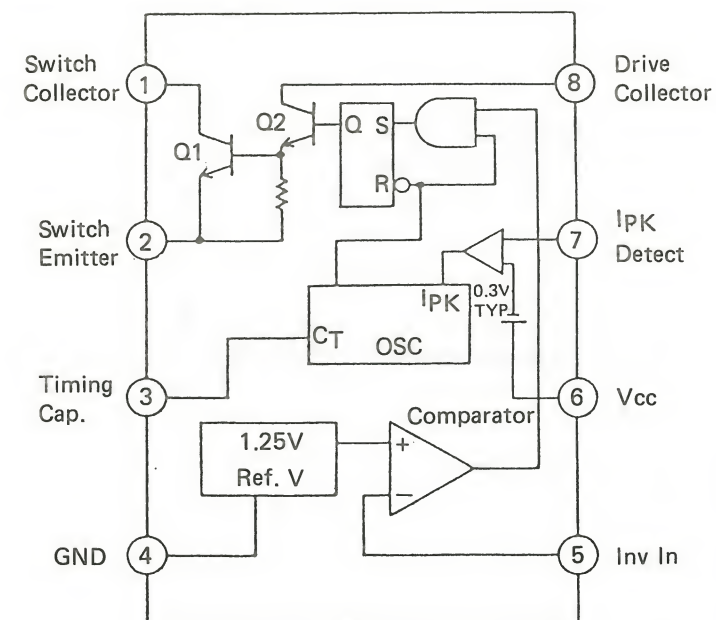
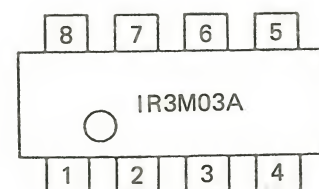
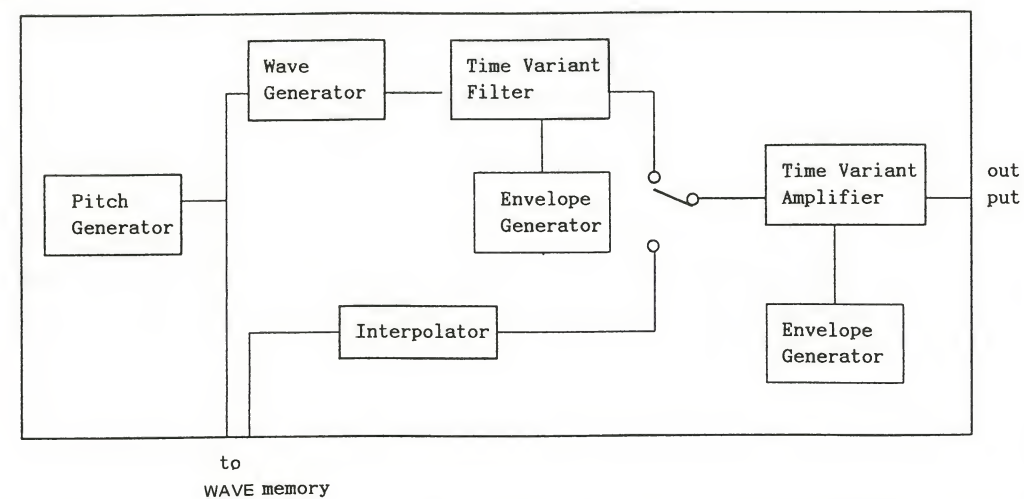
TOP VIEW

IC17 Reverb Chip  
HG61H20R36F

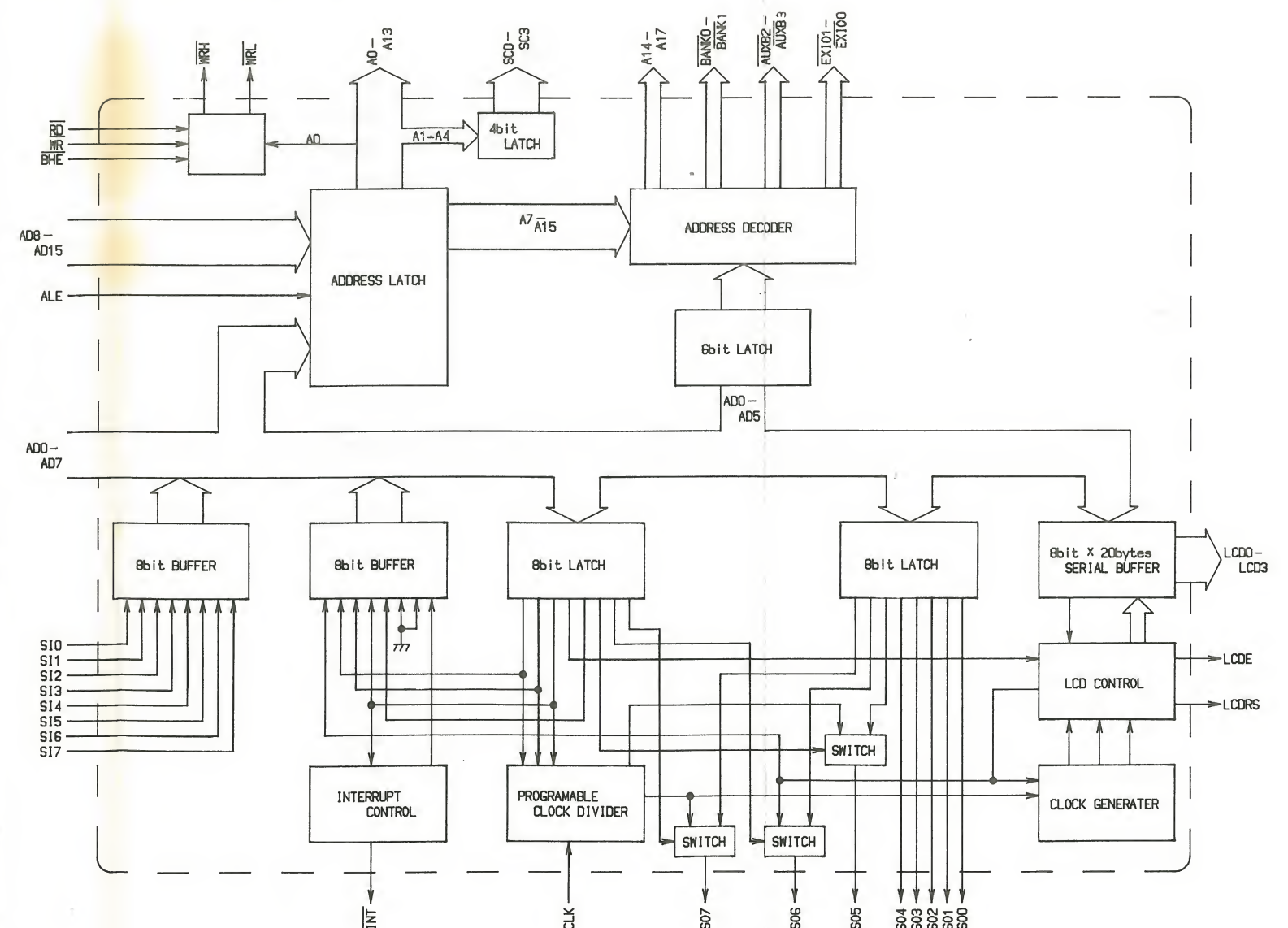
TOP VIEW

IC35 Gate Array  
HG61H15B59F

TOP VIEW

IC18, IC19 Regulator  
IR3M03AIC23 LA Chip  
MB87136

## BLOCK DIAGRAM

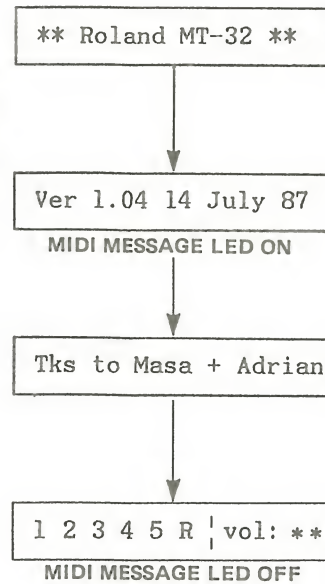


## TEST MODE

## テストモード

## ROM Revision Number

Press and hold PART 4, RHYTHM and MASTER VOLUME simultaneously, then turn the power on. The LCD will change readings with a longer stay at Ver-reading. When LCD reads the sign-on, 1 2 3 4 5 R ..., the unit is ready for normal play without repower.



## ROMバージョン・ナンバー

PART 4, RHYTHM および MASTER VOLUME を同時に押えながら電源を入れる。LCDの表示は左図の様に自動的に変化して行く。

1 2 3 .....が表示されると、通常のプレイモードに入っているの、そのまま演奏が可能である。

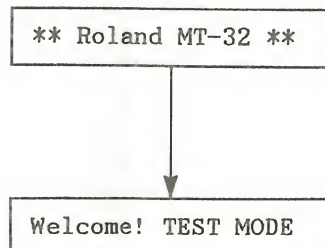
## Checking

- Hookup together MIDI OUT and MIDI IN sockets with the MIDI cable.
- Press and hold PART 3 and VOLUME buttons, then apply the power, holding the two buttons until the LCD reads Welcome!

## 点検

- MIDI OUTとMIDI IN ソケットをMIDI ケーブルで接続する。
- PART 3 と VOLUME ボタンを押しながら電源を入れ、Welcome のメッセージが表示されたら2つのボタンを離す。

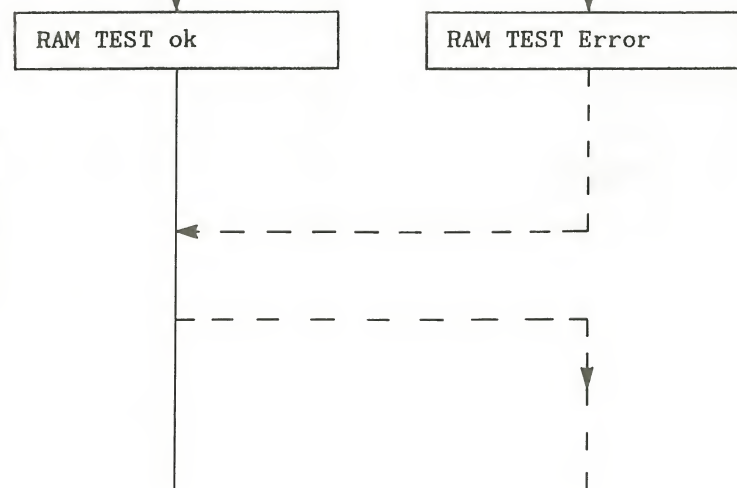
Writing/reading RAMs IC28-IC31



RAM IC28-IC31 書き込み/読み込みテスト中

To ignore Error message, press and hold MASTER VOLUME, then press VOLUME.

When Error, check:  
RAMs: IC28-IC31  
Gate array: IC35  
Buss between IC35 and the RAMs.



Error を無視し、次のテストを実行する場合は、MASTER VOLUME を押しながら VOLUME を押す。

要点検  
RAM: IC28-IC31  
ゲートアレイ: IC35  
両者間のバスライン

To ignore Error message, press and hold MASTER VOLUME, then press VOLUME.

When Error, check gate array, IC35.

MIDI MESSAGE LED should blink

Error indication  
Lighting LED: Check IC24  
Dead LED: Check LED, IC24 and Connector CN4.

- Press PART 1.  
The LED might go off depending on which half cycle of the scanning pulse the switch has been pressed.

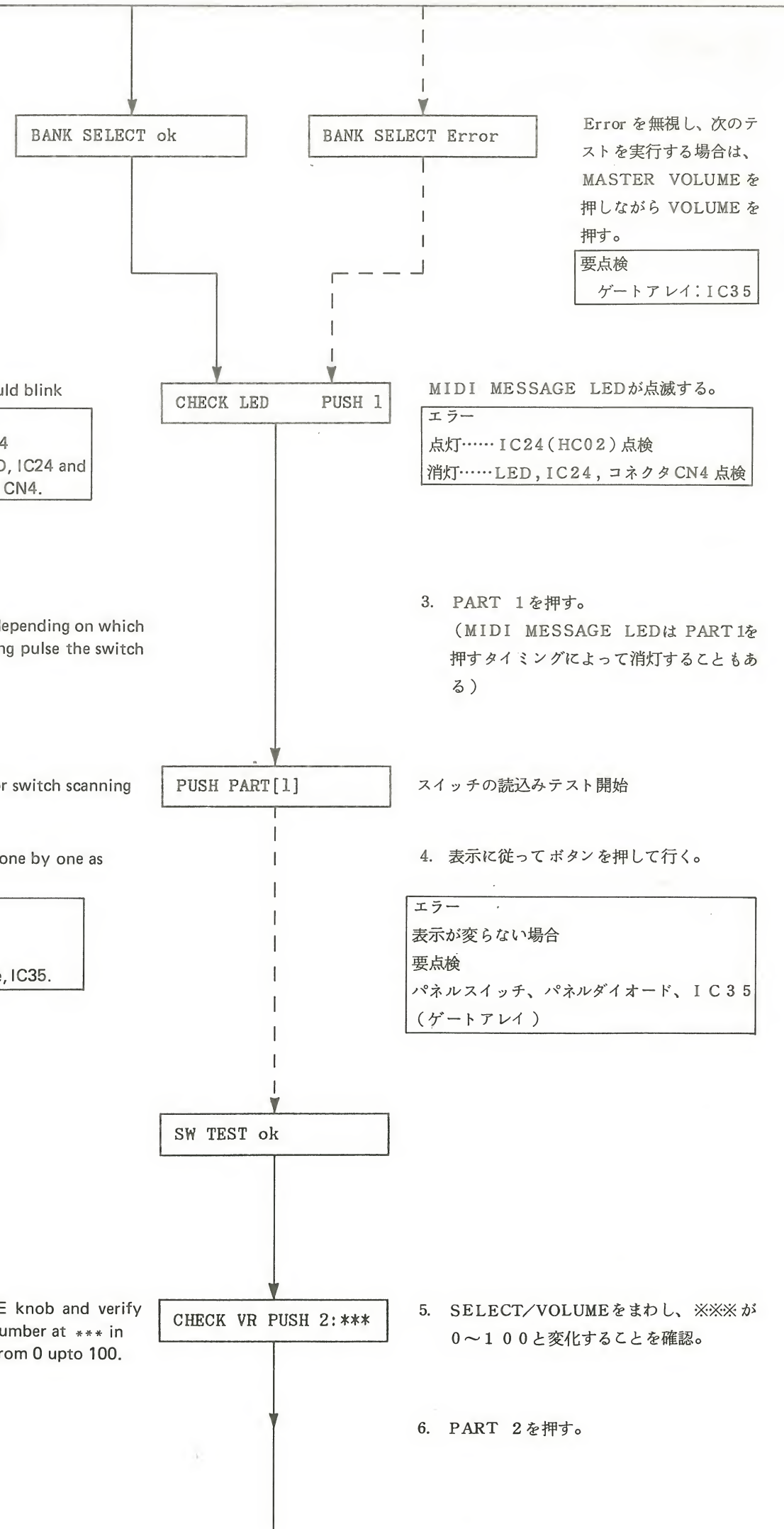
Ready for switch scanning

- Press the panel switches one by one as indicated by LCD.

Error indication  
Reading won't change  
Check:  
Panel switches, panel diode, IC35.

- Turn SELECT/VOLUME knob and verify proportional change in number at \*\*\* in the LCD. It can change from 0 upto 100.

- Press PART 2.



Error を無視し、次のテストを実行する場合は、MASTER VOLUME を押しながら VOLUME を押す。

要点検  
ゲートアレイ: IC35

MIDI MESSAGE LEDが点滅する。

エラー  
点灯..... IC24 (HC02) 点検  
消灯..... LED, IC24, コネクタ CN4 点検

- PART 1 を押す。  
(MIDI MESSAGE LEDはPART1を押すタイミングによって消灯することもある)

スイッチの読み込みテスト開始

- 表示に従ってボタンを押して行く。

エラー  
表示が変わらない場合  
要点検  
パネルスイッチ、パネルダイオード、IC35  
(ゲートアレイ)

- SELECT/VOLUME をまわし、\*\*\* が 0 ~ 100 と変化することを確認。

- PART 2 を押す。

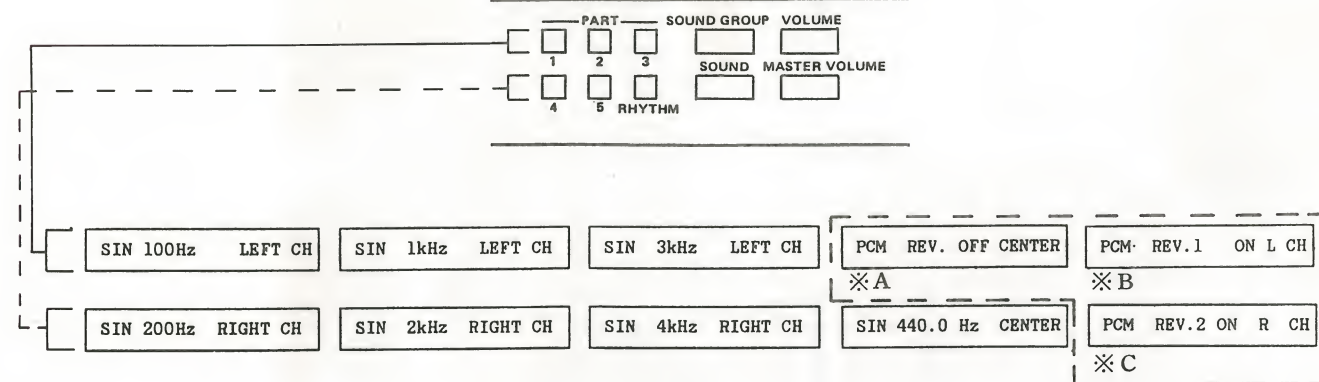


**Error Messages:**  
**Receiver Error**  
 MIDI OUT signal has not reached MIDI IN within the time.  
**Verify Error**  
 There is difference in contents between MIDI OUT and MIDI IN signals.

To ignore Error, hold MASTER VOLUME then press VOLUME.

7 Connect monitors (amp/sp or scope) to both OUTPUT jacks, L and R. The panel switches will serve as tone selectors as shown below.

7-1. Press the buttons one by one, in sequence. Note that PCM will sound a short time. See notes below.



## NOTES

- \*A Direct sound only; from both OUTPUTs.
- \*B Direct and light reverb sounds from OUTPUT L. From R, reverb only.
- \*C Direct and deep reverb sounds from OUTPUT R. From L, deep reverb only.

440Hz

There is a slight difference in volume between R and L OUTPUTs.

1 2 3 4 5 R | vol: \*\*

Play Mode

MIDI OUTからのテスト信号が、一定時間内にMIDI INを通じて受信出来なかった。

MIDI OUT と MIDI IN データに違いがある。

Errorを無視して次のテストを実行する場合は、MASTER VOLUME を押しながら VOLUME を押す。

7. OUTPUT ジャック R, L にモニタ・アンプまたはオシロを接続する。

パネルスイッチには下図の様に音色セレクト機能が割当てられる。

7-1 任意の順にスイッチを押す(ただし、PCM 音は叩いた時のみ出る)

※A……PCM 音(TOM)の直接音のみが両方のジャックから出る。

※B……ジャック L からは直接音と、浅いリバーブ音が出る(TOM)

ジャック R からは浅いリバーブ音のみ

※C……ジャック R から直接音と深いリバーブ音が出る(TOM)

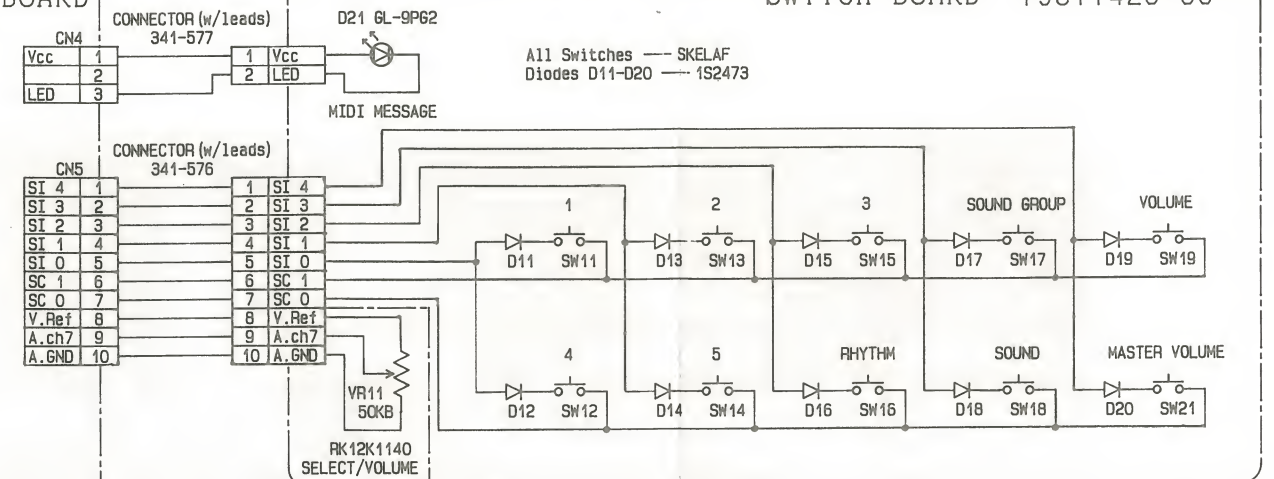
ジャック L からは深いリバーブ音のみが出る。

440Hz の出力は L と R で若干差がある。

8. MASTER VOLUME を押しながら VOLUME を押す。

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

MAIN BOARD

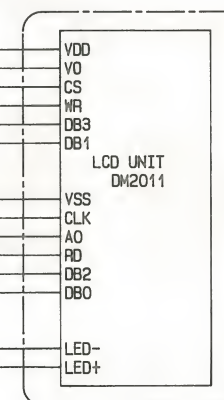


CN1

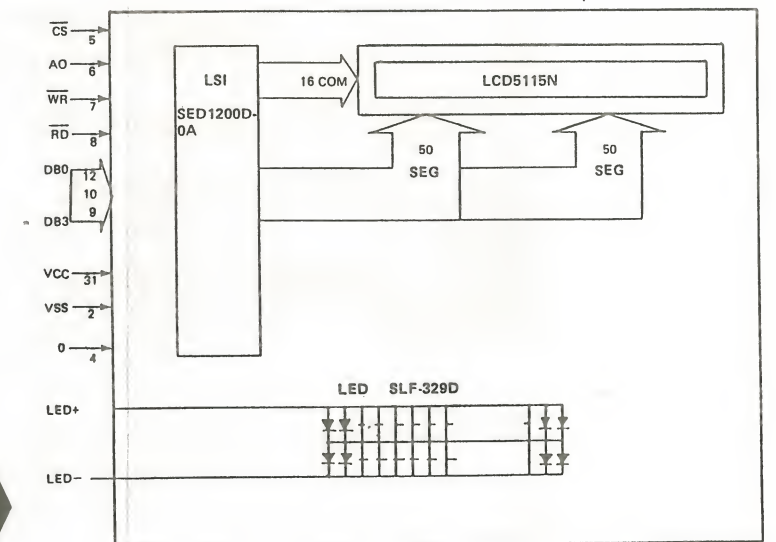
Vcc 1  
V LCD 2  
SO 6 3  
LCD E 4  
LCD 3 5  
LCD 1 6

Vss 1  
SO 7 2  
LCD RS 3  
RD 4  
LCD 2 5  
LCD 0 6

GND 1  
Vcc 2

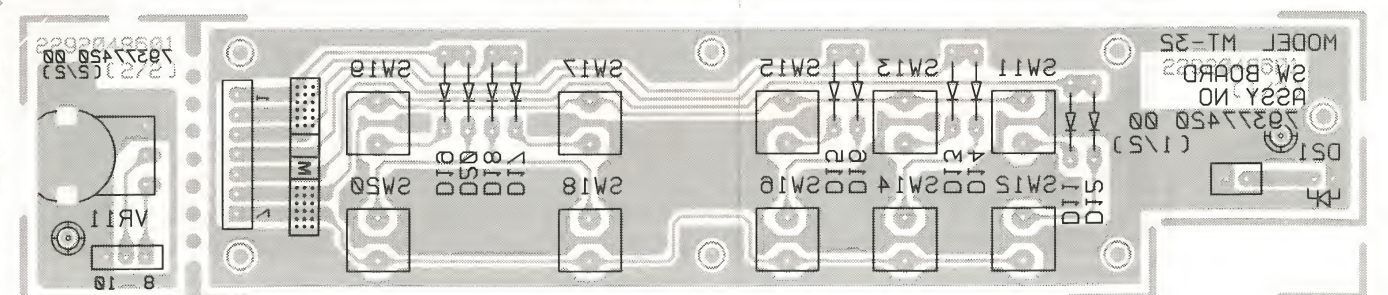


**LCD UNIT**  
DM2011  
Block Diagram



## VR BOARD

(pcb 22920486 2/2)  
Supplied with SW Board

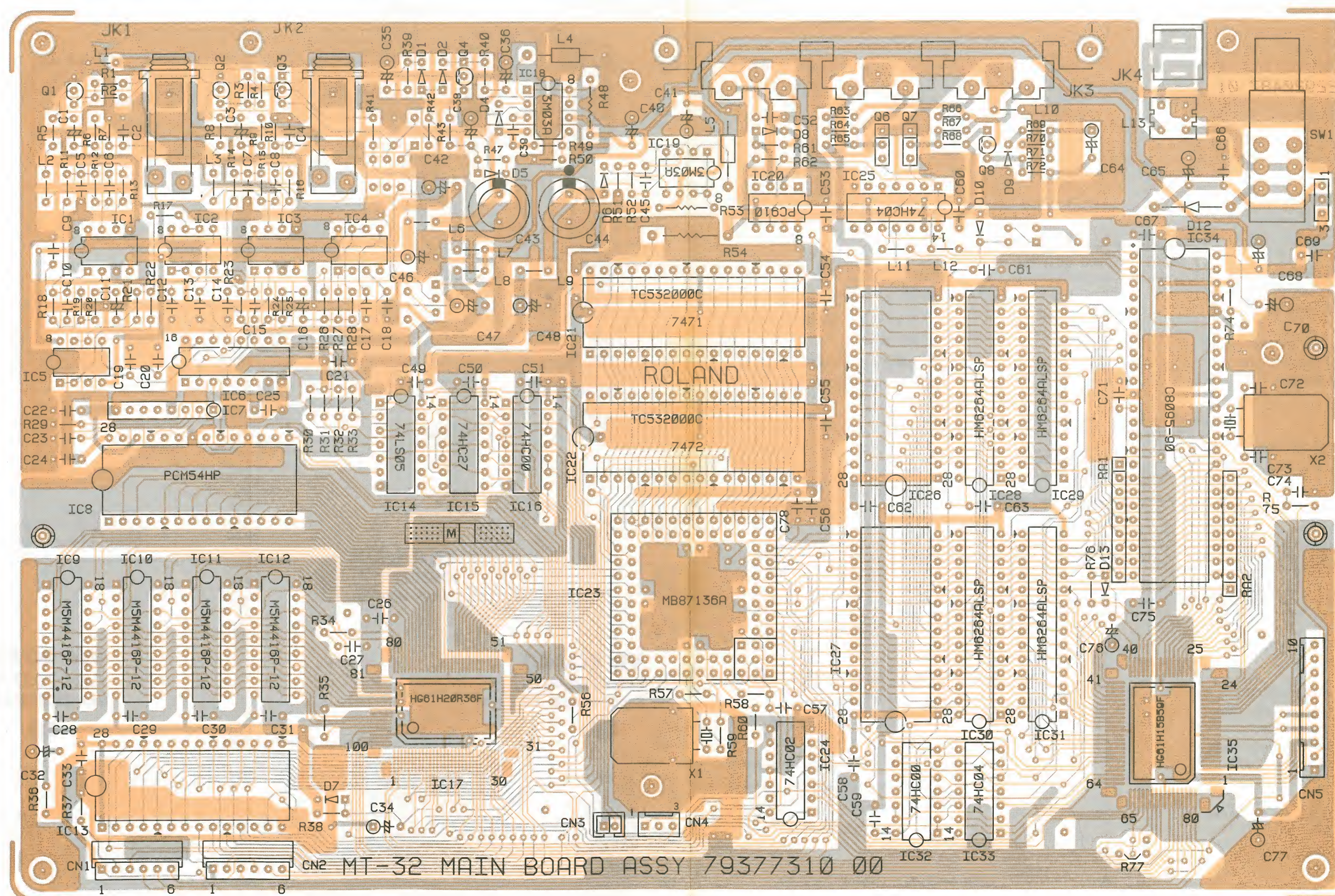


## SW BOARD

Assy 793774200  
(pcb 2292048600)



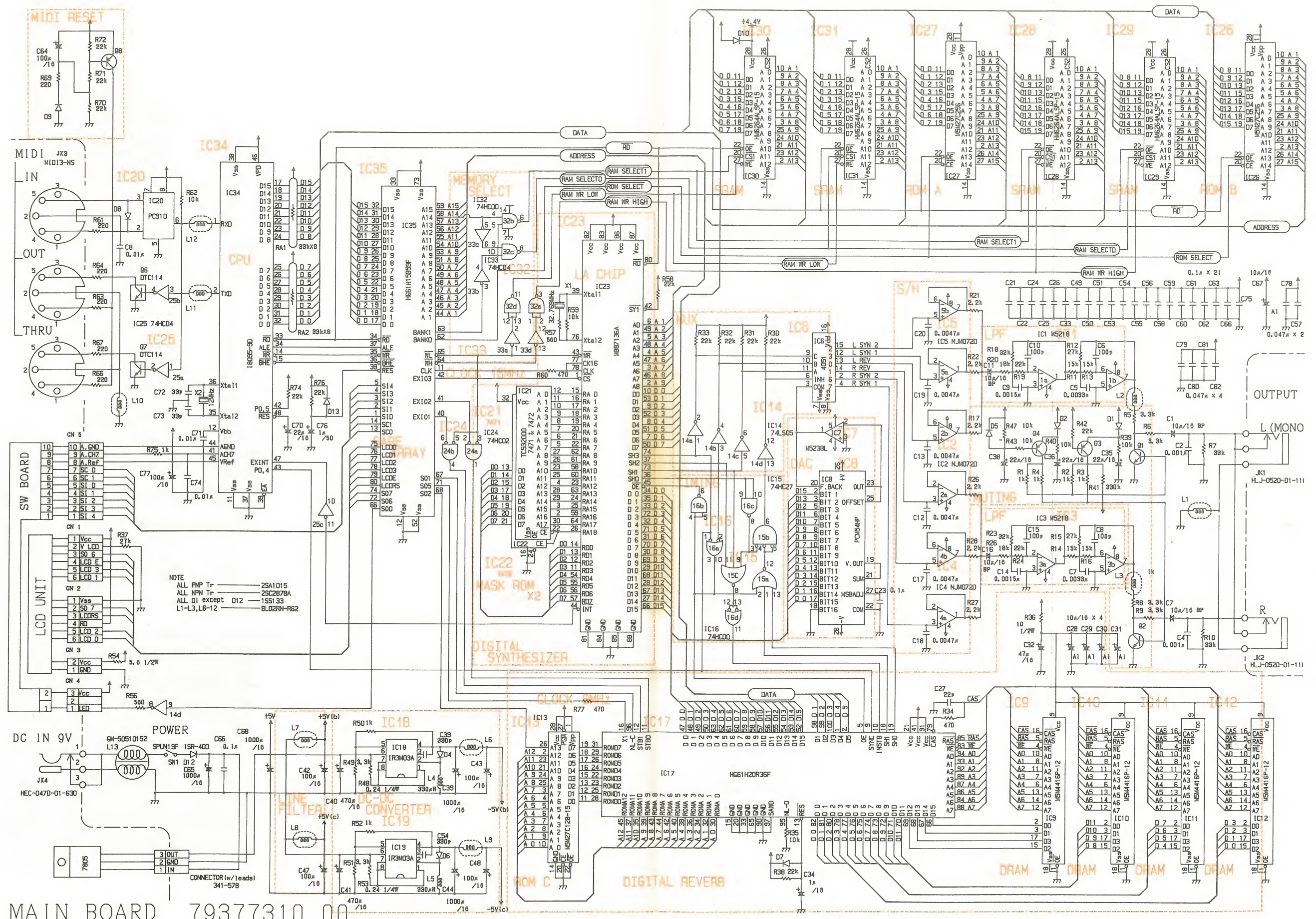
COMPONENT SIDE MARKING MAY 25





1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

## CIRCUIT DIAGRAM









## Rejection RJC 4FH

If MT-32 receives WSD while it is reproducing sound, it sends RJC.  
When MT-32 receives this message, it ends the current handshaking.  
In Overflow Assign mode, MT-32 relays this message to downstream without recognizing it.

Byte	Description
F0H	Exclusive status
41H	Roland - ID
DEV	Device - ID
16H	Model - ID ( MT-32 )
4FH	Command - ID ( RJC )
F7H	EOX ( End of Exclusive )

## Notes :

\*3-1 Both model-IDs are supported. Addresses & parameters are described

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in section 4 for model-ID 16H(MT-32) and in section 5 for model-ID 14H(D-50,PG-1000).  
\*3-2 Address & Size should be the address where data exist.  
\*3-3 If the data is Partial Reserve Parameter, received data must comprise all the parameters for being recognized.

## 4. Address mapping of parameters

Addresses are shown in Hexa-decimal, while numbers are given in 7 bits.

Address	MSB	LSB
00000000	00000000	00000000
00000001	00000001	00000001
00000002	00000002	00000002
00000003	00000003	00000003
00000004	00000004	00000004
00000005	00000005	00000005
00000006	00000006	00000006
00000007	00000007	00000007

The actual address of a parameter in a block is the sum of the start address of each block and one or more offset addresses. That is, parameters marked by \*4-1 have two offset addresses: one in the table under NOTE \*4-1 and the other in Common parameter table or in Partial parameter table.

## Parameter base address

Temporary area ( Accessible on each basic channel )

Start address	Description
00 00 00	Patch Temp Area (part)
01 00 00	Setup Temp Area (rhythm part)
02 00 00	Timbre Temp Area(part) *4-1

Whole part ( Accessible on UNIT# )

Start address	Description
03 00 00	Patch Temp Area ( part 1 )
03 00 10	Patch Temp Area ( part 2 )
03 00 60	Patch Temp Area ( part 7 )
03 00 70	Patch Temp Area ( part 8 )
03 01 00	Patch Temp Area ( rhythm part )
03 01 10	Setup Temp Area (rhythm part)
04 00 00	Timbre Temp Area( part 1 ) *4-1
04 01 76	Timbre Temp Area( part 2 ) *4-1
04 0b 44	Timbre Temp Area( part 7 ) *4-1
04 0d 3a	Timbre Temp Area( part 8 ) *4-1
05 00 00	Patch Memory #1
05 00 08	Patch Memory #2
05 07 70	Patch Memory #127

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05 07 78	Patch Memory #128
08 00 00	Timbre Memory #1 *4-1
08 02 00	Timbre Memory #2 *4-1
08 7c 00	Timbre Memory #63 *4-1
08 7e 00	Timbre Memory #64 *4-1
10 00 00	System area
20 00 00	Display *4-2
7F xx xx	All parameter reset *4-3

## Notes :

\*4-1

Structure of "Timbre Temp/Memory" area is as follows.

Sub start address	Description
00 00 00	Common parameter
00 00 0e	Partial parameter (for Partial# 1)
00 00 48	Partial parameter (for Partial# 2)
00 01 02	Partial parameter (for Partial# 3)
00 01 3c	Partial parameter (for Partial# 4)

\*4-2 The data sent to this address are recognized as the string of letters in ASCII CODE, and displayed on MT-32 LCD. Cannot be called on RQ1 or RQD.

\*4-3 All parameters will be initialized by sending data to this address. Cannot be called on RQ1 or RQD.

## Common parameter

\*4-4

Offset address	Description
00H	0aaa aaaa TONE NAME 1 32 - 127 (ASCII)
09H	0aaa aaaa TONE NAME 10
0AH	0000 aaaa Structure of Partial# 1 & 2 0 - 12 (1 - 13)
0BH	0000 aaaa Structure of Partial# 3 & 4 0 - 12 (1 - 13)
0CH	0000 aaaa PARTIAL MUTE 0 - 15 (0000 - 1111)
0DH	0000 000a ENV MODE 0 - 1 (Normal, No sustain)
Total size	00 00 0EH

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## Partial parameter

\*4-4

Offset address	Description
00 00H	0aaa aaaa WG PITCH COARSE 0 - 96 (C1,C2, - C9)
00 01H	0aaa aaaa WG PITCH FINE 0 - 100 (-50 - +50)
00 02H	0000 aaaa WG PITCH KEYFOLLOW 0 - 16 (-1,-1/2,-1/4,0,1/8,1/4,3/8,1/2,5/8,3/4,7/8,1,5/4,3/2,2,sl,s2)
00 03H	0000 000a WG PITCH BENDER SW 0 - 1 (OFF, ON)
00 04H	0000 000a WG WAVEFORM 0 - 1 (SQU, SAW)
00 05H	0aaa aaaa WG PCM WAVE # 0 - 127 (1 - 128)
00 06H	0aaa aaaa WG PULSE WIDTH 0 - 100
00 07H	0000 aaaa WG PW VELO SENS 0 - 14 (-7 - +7)
00 08H	0000 aaaa P-ENV DEPTH 0 - 10
00 09H	0aaa aaaa P-ENV VELO SENS 0 - 100
00 0AH	0000 0aaa P-ENV TIME KEYF 0 - 4
00 0BH	0aaa aaaa P-ENV TIME 1 0 - 100
00 0CH	0aaa aaaa P-ENV TIME 2 0 - 100
00 0DH	0aaa aaaa P-ENV TIME 3 0 - 100
00 0EH	0aaa aaaa P-ENV TIME 4 0 - 100
00 0FH	0aaa aaaa P-ENV LEVEL 0 0 - 100 (-50 - +50)
00 10H	0aaa aaaa P-ENV LEVEL 1 0 - 100 (-50 - +50)
00 11H	0aaa aaaa P-ENV LEVEL 2 0 - 100 (-50 - +50)
00 12H	0aaa aaaa P-ENV SUSTAIN LEVEL 0 - 100 (-50 - +50)
00 13H	0aaa aaaa END LEVEL 0 - 100 (-50 - +50)
00 14H	0aaa aaaa P-LFO RATE 0 - 100
00 15H	0aaa aaaa P-LFO DEPTH 0 - 100
00 16H	0aaa aaaa P-LFO MOD SENS 0 - 100
00 17H	0aaa aaaa TVF CUTOFF FREQ 0 - 100
00 18H	000a aaaa TVF RESONANCE 0 - 30
00 19H	0000 aaaa TVF KEYFOLLOW 0 - 14 (-1,-1/2,-1/4,0,1/8,1/4,3/8,1/2,5/8,3/4,7/8,1,5/4,3/2,2)
00 1AH	0aaa aaaa TVF BIAS POINT/DIR 0 - 127 (<1A - <7C >1A - >7C)
00 1BH	0000 aaaa TVF BIAS LEVEL 0 - 14 (-7 - +7)
00 1CH	0aaa aaaa TVF ENV DEPTH 0 - 100

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00 1DH	0aaa aaaa	TVF ENV VELO SENS	0 - 100
00 1EH	0000 0aaa	TVF ENV DEPTH KEYF	0 - 4
00 1FH	0000 0aaa	TVF ENV TIME KEYF	0 - 4
00 20H	0aaa aaaa	TVF ENV TIME 1	0 - 100
00 21H	0aaa aaaa	TVF ENV TIME 2	0 - 100
00 22H	0aaa aaaa	TVF ENV TIME 3	0 - 100
00 23H	0aaa aaaa	TVF ENV TIME 4	0 - 100
00 24H	0aaa aaaa	TVF ENV TIME 5	0 - 100
00 25H	0aaa aaaa	TVF ENV LEVEL 1	0 - 100
00 26H	0aaa aaaa	TVF ENV LEVEL 2	0 - 100
00 27H	0aaa aaaa	TVF ENV LEVEL 3	0 - 100
00 28H	0aaa aaaa	TVF ENV SUSTAIN LEVEL	0 - 100
00 29H	0aaa aaaa	TVA LEVEL	0 - 100
00 2AH	0aaa aaaa	TVA VELO SENS	0 - 100
00 2BH	0aaa aaaa	TVA BIAS POINT 1	0 - 127 (<1A - <7C >1A - >7C)
00 2CH	0000 aaaa	TVA BIAS LEVEL 1	0 - 12 (-12 - 0)
00 2DH	0aaa aaaa	TVA BIAS POINT 2	0 - 127 (<1A - <7C >1A - >7C)
00 2EH	0000 aaaa	TVA BIAS LEVEL 2	0 - 12 (-12 - 0)

00 2FH	0000 0aaa	TVA ENV TIME KEYF	0 - 4
00 30H	0000 0aaa	TVA ENV TIME V_FOLLOW	0 - 4
00 31H	0aaa aaaa	TVA ENV TIME 1	0 - 100
00 32H	0aaa aaaa	TVA ENV TIME 2	0 - 100
00 33H	0aaa aaaa	TVA ENV TIME 3	0 - 100
00 34H	0aaa aaaa	TVA ENV TIME 4	0 - 100
00 35H	0aaa aaaa	TVA ENV TIME 5	0 - 100
00 36H	0aaa aaaa	TVA ENV LEVEL 1	0 - 100
00 37H	0aaa aaaa	TVA ENV LEVEL 2	0 - 100
00 38H	0aaa aaaa	TVA ENV LEVEL 3	0 - 100
00 39H	0aaa aaaa	TVA ENV SUSTAIN LEVEL	0 - 100
Total size	00 00 3AH		

## System area

Offset address	Description
00 00H	0aaa aaaa MASTER TUNE 0 - 127 (432.1Hz - 457.6Hz)
00 01H	0000 00aa REVERB MODE 0 - 3 (Room, Hall, Plate, Tap delay)
00 02H	0000 0aaa REVERB TIME 0 - 7 (1 - 8)
00 03H	0000 0aaa REVERB LEVEL 0 - 7
00 04H	00aa aaaa PARTIAL RESERVE (Part 1) 0 - 32
00 05H	00aa aaaa PARTIAL RESERVE (Part 2) 0 - 32
00 06H	00aa aaaa PARTIAL RESERVE (Part 3) 0 - 32
00 07H	00aa aaaa PARTIAL RESERVE (Part 4) 0 - 32
00 08H	00aa aaaa PARTIAL RESERVE (Part 5) 0 - 32
00 09H	00aa aaaa PARTIAL RESERVE (Part 6) 0 - 32

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00 0AH	00aa aaaa	PARTIAL RESERVE (Part 7)	0 - 32
00 0BH	00aa aaaa	PARTIAL RESERVE (Part 8)	0 - 32
00 0CH	00aa aaaa	PARTIAL RESERVE (Part R)	0 - 32
00 0DH	000a aaaa	MIDI CHANNEL (Part 1)	0 - 16 (1 - 16,OFF)
00 0EH	000a aaaa	MIDI CHANNEL (Part 2)	0 - 16 (1 - 16,OFF)
00 0FH	000a aaaa	MIDI CHANNEL (Part 3)	0 - 16 (1 - 16,OFF)
00 10H	000a aaaa	MIDI CHANNEL (Part 4)	0 - 16 (1 - 16,OFF)
00 11H	000a aaaa	MIDI CHANNEL (Part 5)	0 - 16 (1 - 16,OFF)
00 12H	000a aaaa	MIDI CHANNEL (Part 6)	0 - 16 (1 - 16,OFF)
00 13H	000a aaaa	MIDI CHANNEL (Part 7)	0 - 16 (1 - 16,OFF)
00 14H	000a aaaa	MIDI CHANNEL (Part 8)	0 - 16 (1 - 16,OFF)
00 15H	000a aaaa	MIDI CHANNEL (Part R)	0 - 16 (1 - 16,OFF)
00 16H	0aaa aaaa	MASTER VOLUME	0 - 100
Total size	00 00 17H		

## Rhythm part setup

Offset address	Description	
00 00H	0aaa aaaa	TIMBRE 0 - 94 (M1-M64, R1-R30, OFF)
00 01H	0aaa aaaa	OUTPUT LEVEL 0 - 100
00 02H	0000 aaaa	PANPOT 0 - 14 (R - L)
00 03H	0000 000a	REVERB SWITCH 0 - 1 (OFF, ON)
Total size	00 00 04H	

## Patch temp

Offset address	Description
00 00H	0000 00aa TIMBRE GROUP 0 - 3 (GROUP A, GROUP B, MEMORY, RHYTHM)
00 01H	00aa aaaa TIMBRE NUMBER 0 - 63 (1 - 64)
00 02H	00aa aaaa KEY SHIFT 0 - 48 (-24 - +24)
00 03H	0aaa aaaa FINE TUNE 0 - 100 (-50 - +50)
00 04H	000a aaaa BENDER RANGE 0 - 24



